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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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*Ex parte* S. R. NARAYANAN
and THOMAS VALDEZ

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Appeal 2009-0454
Application 09/489,514
Technology Center 1700

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Decided:[1] March 24, 2009

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Before CHUNG K. PAK, CHARLES F. WARREN, and
BEVERLY A. FRANKLIN, *Administrative Patent Judges*.

FRANKLIN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

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[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the Decided Date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

Appellants seek our review under 35 U.S.C. § 134 of the rejection of claims 7-10 and 12-26.[2] We have jurisdiction under 35 U.S.C. § 6(b).

Claims 7 and 18 are representative of the subject matter on appeal and are set forth below:

7. A process for making a catalyst ink for a fuel cell, comprising

mixing, at room temperature, components comprising water, particles of a fluorocarbon polymer with a particle size of 1 to 4 microns, an ionomer which has a property of improving ion conduction, and a catalytic material including platinum and which are randomly spaced and uniformly mixed.

18. A process comprising:

(a) providing a catalyst ink comprising particles of a fluorocarbon polymer with a particle size of 1 to 4 microns, an ionomer which has a property of improving ion conduction, and a catalytic material including platinum and another catalytic material, randomly spaced and uniformly mixed;

(b) applying the catalyst ink at room temperature to at least one side of a membrane;

(c) bonding the membrane to at least one electrode and using said membrane as a cathode of a direct methanol fuel cell.

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[2] On page 2 of the Office Action mailed May 25, 2006, to which the App. Br. responds (at page 2), the "Final" box is not checked on form PTO-326, and on page 6, there is no language indicating that the action is made final. However, on page 2 of the Office Action mailed May 25, 2006, the Examiner states that "[t]his Office [A]ction maintains the Final rejection of the claims." We interpret this to mean referral to the attributes of a proper final rejection that are set forth in the Final Rejection mailed on February 9, 2006. Thus, this appeal is taken from the Examiner twice rejecting the claims.

The prior art relied upon by the Examiner in rejecting the claims, as listed on page 3 of the Answer, is:

| | | |
|---|---|---|
| Samuels | US 4,524,114 | Jun. 18, 1985 |
| Trainham III (Trainham) | US 5,411,641 | May 2, 1995 |
| Serpico | US 5,677,074 | Oct. 14, 1997 |
| Kindler | US 5,992,008 | Nov. 30, 1999 |

DuPont Zonyl® Ink and Coating Guide, pp. 1-4 (1997) available at: http://www2.dupont.com/Teflon_Industrial/en_US/assets/downloads/h07812.pdf

DuPont Teflon® PTFE 30B Product Information, pp. 1-4 (1999), available at:http://www2.dupont.com/Teflon_Industrial/en_US/assets/downloads/h03236.pdf [3]

SUMMARY OF THE DECISION

We AFFIRM.

THE REJECTIONS

Claim 18 is rejected under 35 U.S.C § 101 and § 112, second paragraph.[4]

Claims 7-10, 13, 14, 18, 20, and 23-26 are rejected under 35 U.S.C. § 103 in view of Serpico, DuPont Zonyl, and Trainham.[5]

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[3] This reference is discussed in the grounds of rejection to indicate known properties of "Dupont Teflon 30B," but is not included in the statement of the rejection (Ans. 5-6).

[4] The Examiner's specific comments on the grounds of rejection for this rejection are set forth in the Office Action mailed on May 25, 2006.

[5] The Examiner's specific comments on the grounds of rejection for this rejection are set forth in the Office Action mailed on February 9, 2006. In this Office Action, the Examiner added Trainham to the statement of the rejection in response to Appellants' amendment filed on November 23, 2005.

Claim 12 is rejected under 35 U.S.C. § 103 over Serpico, DuPont Zonyl, Trainham, and further in view of Kindler.[6]

Claims 15-17, 19, 21, and 22 are rejected under 35 U.S.C. § 103 over Serpico, Dupont Zonyl, Trainham, and further in view of Samuels.[7]

## ISSUE

Whether Appellants have established that the Examiner improperly rejected claim 18 under 35 U.S.C. § 101 and § 112, second paragraph?

Whether Appellants have shown reversible error in each of the Examiner's 35 U.S.C. § 103 rejections by evincing that a lack of motivation exists for a proper prima facie case of obviousness?

## FINDINGS OF FACT

Serpico teaches a process for making a catalyst ink for a fuel cell comprising mixing, at room temperature, water and particles of a fluorocarbon polymer having a particle size of from 0.05 microns to 500 microns (col. 2, ll. 42-43). The catalytic material comprises platinum (col. 4, l. 19), which can be mixed with other noble metals such as ruthenium (col. 4, l. 24). The nonionic fluorocarbon polymers can comprise polytetrafluoroethylene (col. 3, line 64 to col. 4, line 51). The catalyzed-carbon/fluorocarbon polymer mixture is infiltrated with an ionic hydrocarbon polymer electrolyte (ionomer) (col. 4, ll. 52-53; *see also* col. 3,

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[6] The Examiner's specific comments on the grounds of rejection involving Kindler are set forth in the Office Action mailed on June 20, 2001.

[7] The Examiner's specific comments on the grounds of rejection involving Samuels are set forth in the Office Action mailed on June 20, 2001.

ll. 58-59). The ionomer may be impregnated into the structure by conventional means, such as dipping, spraying, brushing, rolling, or printing (col. 4, l. 52 to col. 5, l. 24).

Serpico, in Example 1, teaches preparation of a catalyzed-carbon electrode (col. 6, ll. 25-49) which is impregnated with the ionomer solution by placing it onto the surface of the solution that is located in a petri dish (col. 6, ll. 50-61) for 10 minutes. Two electrodes are prepared in this manner, and then are laminated to a 50 um thick hydrocarbon ionomer membrane by pressing (col. 6, lines 62-65).

Serpico discloses a particle size range of 0.05 microns to 500 microns (col. 2, lines 42-43). The suspension is coated onto carbon paper (col. 3, line 19).

Trainham discloses that "loadings of electrochemically active material may very based on the method of application to the membrane' (col. 8, lines 9-11). Trainham further discloses that among the available methods is the distribution of material "as thin films from inks onto the membranes" (col. 8, lines 11-15). Trainham cites as an illustration the method described by Wilson and Gottesfeld[8] wherein a sulfonated fluoroionomer such as NAFION® is added to catalyst inks to "enhance the catalyst-ionomer surface contact and to act as a binder to the NAFION® membrane sheet" (col. 8, lines 15-22). Trainham teaches that the ionomer can be an ingredient of the ink composition, which is then distributed onto a sheet (col. 8, ll. 9-24).

[8] "High Performance Catalyzed membranes of Ultra-low Pt Loadings for Polymer ElectrolyteFuel Cell," J. Electrochem. Soc., Vol. 139, No. 2 L28-30 (1992).

Kindler teaches use of a liquid copolymer of tetrafluoroethylene and perfluorovinylether sulfonic acid (col. 3, ll. 36-38, col. 6, l. 28 *et seq).*

Samuels discloses roughening the surface of the membrane using silcon carbide prior to catalyst deposition (col. 7, l. 33).

## PRINCIPLES OF LAW

With regard to the 35 U.S.C. § 101[9] and § 112, second paragraph rejections, at issue are claims that claim a use rather than a process of using. For example, claims beginning with "Use of" often draw rejections on the grounds that they do not cover statutory subject matter. MPEP § 2173.05(q) discusses use claims and rejections of them under both 35 U.S.C. § 101 and § 112, second paragraph.

In the case of *In re Hirao*, 535 F.2d 67 (CCPA 1976), neither a § 101 nor a § 112, second paragraph rejection was made. This case involved a process of sweetening foods and drinks. The process comprises three steps, the first two being a method of forming a high purity maltose product (which is the sweetening agent) and the third being the use of this product to sweeten the food or drink. Claim 1, the sole independent claim, is illustrative:

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[9] 35 U.S.C. § 101 defines four categories of inventions that Congress deemed to be appropriate subject matter of a patent: processes, machines, manufacturers, and compositions of matter. The latter three categories define "things" or "products" while the first category defines "actions" (i.e., inventions that consist of a series of steps or acts to be performed). *See* 35 U.S.C. § 100(b) ("The term 'process' means process, art, or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material"). MPEP § 2100, p. 9 ( Rev. 6, Sept. 2007).

1. A process for preparing foods and drinks sweetened mildly, and protected against discoloration, Strecker's reaction, and moisture absorption, which comprises:
[1] adding a-1,6-glucosidase and b-amylase, under such conditions and in a quantity sufficient to produce straight chain amylose, to enzymatically liquefied starch which consists essentially of amylopectin thereby producing straight-chain amylose;
[2] subjecting the resulting amylose to the action of b-amylase and purifying and drying to obtain high purity maltose in crystalline powder form of 90-95% maltose; and then
[3] adding said high purity crystalline maltose powder to foods and drinks as the essential added sweetener.

With regard to the 35 U.S.C. § 103 rejections, the rationale supplying the motivation needed to modify the prior art to arrive at the claimed invention can differ from that relied on by the inventor. So long as the prior art suggests what the inventor has ultimately done, it does not matter that the art had a different purpose or solved a separate problem. *In re Linter*, 458 F.2d 1013, 1016 (CCPA 1972); *In re Dillon*, 919 F.2d 688, 693-94 (Fed. Cir. 1990), (*en banc*), *cert. denied*, 500 U.S. 904 (1991). "In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. What matters is the objective reach of the claim. If the claim extends to what is obvious, it is invalid under § 103. One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the

patent's claims." *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741-42 (2007).

ANALYSIS

I. The § 101 rejection and § 112, second paragraph, rejection of claim 18.

Claim 18 is similar to the fact situation in *In re Hirao*, *supra*. That is, in the case of *Ex parte Hirao*, there are the first two steps, being a method of forming an intermediate product, and a third step, being the use of the product to sweeten the food or drink. In the instant case, in claim 18, we have the first three steps being a method of making a cathode, and a fourth step, being the use of the cathode in making a direct methanol fuel cell.

In view of the above comparison made with *In re Hirao*, we determine that, as in *In re Hirao*, neither a § 101 rejection nor a § 112, second paragraph rejection of claim 18 is appropriate. Indeed, as Appellants point out, 35 U.S.C. § 101 does not split the "process" category of invention into the categories of "making" and "use" as the Examiner contends. Br., e.g., 4-5; Ans., e.g., 4, and 7-9.

We therefore reverse both the § 101 and § 112, second paragraph, rejections of claim 18 made by the Examiner.

II. The 35 U.S.C. § 103 rejection of claims 7-10, 13, 14, 18, 20, and 23-26 over Serpico, Dupont Zonyl, and Trainham

Appellants argue that Serpico does not teach explicitly adding an ionomer to the catalyst ink. Appellants argue that Trainham's reason for adding the NAFION® ionomer is "to enhance the catalyst-ionomer surface

contact and to act as a binder to the Nafion membrane sheet." Br. 6-7. Appellants argue that nothing in Trainham would have led the skilled artisan to the claimed subject matter of adding an ionomer with "a property of improving ion conduction," as required by the claims.[10] Appellants state that the ionomer in Trainham is only added for the purpose of improving binding, not for improving ion conduction. Br. 7.

Serpico impregnates the ionomer into the structure [e.g. into the spray-coated sheet of Example 1 of Serpico] by conventional means, such as dipping, spraying, brushing, rolling, or printing (col. 5, ll. 21-24). Trainham teaches that the ionomer can be an ingredient of an ink composition which is distributed onto a sheet (col. 8, ll. 9-24). The Examiner explains that the motivation for modifying Serpico according to Trainham is to "enhance the catalyst-ionomer surface contact and to act as a binder to the NAFION® membrane sheet" (Ans. 6). Appellants argue that because their reason for using the ionomer [for the property of improving ion conduction] is different than the reason taught by Trainham [to enhance the catalyst-ionomer surface contact and to act as a binder to the NAFION® membrane sheet], motivation is lacking for a proper prima facie case of obviousness (Br. 6-7).

We note that the rationale supplying the motivation needed to modify the prior art to arrive at the claimed invention can differ from that relied on by the inventor. So long as the prior art suggests what the inventor has ultimately done, it does not matter that the art had a different purpose or

[10] The recitation regarding "improving ion conduction" or "ion conducting material" is found in each of the independent claims 7, 13, 18, and 20, as well as in dependent claims 23, 24, 25, and 26.

solved a separate problem. *Linter*, 458 F.2d at 1016; *Dillon*, 919 F.2d at 693-694. *See also KSR*, 127 S. Ct. at 1741-42.

As recognized by the Examiner on page 10 of the Answer, "[n]otwithstanding another purpose for which Trainham [III et al.] arguably employs Nafion, the Nafion is nonetheless added as part of the catalyst ink mixture." The Examiner also notes that the NAFION® ionomer employed in Trainham is the exact material claimed by Appellant, and thus would have the same property of improving ion conduction. Ans. 10.

With respect to claims 23-26, Appellants argue that these claims define that the ionomer is NAFION® configured as an ion conducting material. Br. 7. This aspect of the claims regarding the property of improving ion conduction has been addressed, *supra*.

Appellants also argue that claim 13, for example, includes providing a catalyst ink comprising water, ionomer, and a catalytic material including platinum and another catalytic material, and preparing a substrate of carbon fiber paper by adding fluorocarbon polymer to the carbon fiber paper. Br. 8. As explained by the Examiner, as discussed, *supra*, and as supported by the Findings of Facts, *supra*, these aspects of the claimed invention are either taught or suggested by the applied art.

In view of the above, we agree with the Examiner's 35 U.S.C. § 103 rejection of claims 7-10, 13, 14, 18, 20, and 23-26 as being obvious over Serpico, Dupont Zonyl, and Trainham.

III. The 35 U.S.C. § 103 rejection of claim 12 over Serpico, Dupont Zonyl, Trainham, and further in view of Kindler

We refer to the Examiner's position regarding this rejection on pages 6-7 of the Answer. Appellants do not specifically address this claim (claim 12) or this rejection. That is, Appellants argue that "[m]any of the dependent claims should also be allowable for analogous reasons." Br. 7. We understand this to mean that Appellants rely on the same arguments as discussed in the previous rejection, for this rejection. Therefore, for the same reasons that we affirmed the previous rejection, we also affirm this rejection.

IV. The 35 U.S.C. § 103 rejection of claims 15-17, 19, 21, and 22 over Serpico, Dupont Zonyl, Trainham, and further in view of Samuels

We refer to the Examiner's position on page 7 of the Answer. Again, Appellants do not specifically address this rejection. Therefore, for the same reasons we affirmed the previous rejections, we affirm this rejection.

## CONCLUSIONS OF LAW

The Examiner did not properly reject claim 18 under 35 U.S.C. § 101 and § 112, second paragraph.

Appellants have not shown reversible error in each of the Examiner's 35 U.S.C. § 103 rejections because of their failure to evince that a lack of motivation exists for a proper prima facie case of obviousness.

## DECISION

The 35 U.S.C. § 101 rejection and § 112, second paragraph rejection of claim 18 are reversed.

Each of the 35 U.S.C. § 103 rejections is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv)(effective Sept. 13, 2004).

AFFIRMED

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